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U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY 'S DOCKET NUMBER
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371	136.164 U S APPLICATION NO (If known, see 37 CFR 1 5 10/031245

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/FR00/01012	18 April 2000	19 April 1999

TITLE OF INVENTION SYSTEM FOR IMPLEMENTING TELEPHONE SERVICES, AUTOMATIC BRANCH EXCHANGE CONTROL DEVICE AND CTI SERVER

APPLICANT(S) FOR DO/EO/US

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [X] This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. [ ] This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. [ ] This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. [ ] The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. [X] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [ ] is attached hereto (required only if not communicated by the International Bureau).
   b. [X] has been communicated by the International Bureau.
   c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [X] An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
   a. [X] is attached hereto.
   b. [ ] has been previously submitted under 35 U.S.C. 154(d)(4).
7. [ ] Amendments to the claims of the International Aplication under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. [ ] are attached hereto (required only if not communicated by the International Bureau).
   b. [ ] have been communicated by the International Bureau.
   c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [ ] have not been made and will not be made.
8. [ ] An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. [X] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). (unexecuted)
10. [ ] An English lanugage translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. [X] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. [ ] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [X] A FIRST preliminary amendment. (including substitute specification, claims, abstract- 11 pages)
14. [ ] A SECOND or SUBSEQUENT preliminary amendment.
15. [X] A substitute specification, claims abstract.
16. [ ] A change of power of attorney and/or address letter.
17. [ ] A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. [ ] A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. [ ] A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. [ ] Other items or information:

U.S. APPLICATION NO (if known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO	ATTORNEY'S DOCKET NUMBER
10/031245	PCT/FR00/01012	136.164

21. ☐ The following fees are submitted:	CALCULATIONS PTO USE ONLY	
BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):		
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO **$1000.00**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO **$860.00**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **$710.00**		
International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) **$690.00**		
International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) **$100.00**		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$860.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$ --	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	20 - 20 =	0	x **$18.00**	$ --	
Independent claims	2 - 3 =	0	x **$80.00**	$ --	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ **$270.00**	$ --	
TOTAL OF ABOVE CALCULATIONS =				$860.00	
☐ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2. +				$ --	
SUBTOTAL =				$860.00	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				$ --	
TOTAL NATIONAL FEE =				$860.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +				$ --	
TOTAL FEES ENCLOSED =				$860.00	
				Amount to be refunded:	$
				charged:	$

a. ☒ A check in the amount of $ 860.00 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of $ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 14-1080 . A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO.

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SIGNATURE

James E. Nilles
NAME

16,663
REGISTRATION NUMBER

October 19, 2001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

National Phase of PCT/FR00/01012

International Filing Date: April 18, 2000

Inventor: Christian Collette

Title: *System for Implementing Telephone Services, Automatic Branch Exchange Control Device and CTI Server*

Priority: French Application No. 99 04905; Filed April 19, 1999

Attorney Docket: 136.164 Customer No. 023907

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
DO/EO/US
Washington DC 20231

Sir:

This Preliminary Amendment is directed to a new U.S. application as identified above. Please enter this preliminary amendment prior to calculating the fees.

Please substitute the attached specification, claims, and abstract (11 pages) for the English translation of the PCT application as filed and use the substitute application for examination purposes.

A marked-up version of the amended application is attached and entitled *Version With Markings to Show Changes Made*.

REMARKS

This application has been amended to insert headings in the specification, to incorporate revisions made to the claims under Article 34, including canceling claims 16 and 18 and adding claims 19-22. The claims are further amended to eliminate the multiple dependencies. The Abstract has also been amended to place in it conformance with U.S. Patent Office practice. Entry of the amendments and early consideration and allowance are respectfully requested.

Respectfully submitted,

James E. Nilles

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Dated: October 19, 2001

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Christian Collette

Group Art Unit: (not known)

Serial No.: 10/031,245

Examiner: (not known)

Filing/Received Date: October 19, 2001

Docket No. 136.164

For: *System for Implementing Telephone Services, Automatic Branch Exchange Control Device and CTI Server*

Customer No. 023907

Confirmation No. 5005

SUPPLEMENTAL PRELIMINARY AMENDMENT

Assistant Commissioner of Patents
Box PCT
Washington, DC 20231

Sir:

This Supplemental Preliminary Amendment is being filed for the purpose of amending the claims filed in the corresponding French international application under Article 34. Please enter this preliminary amendment prior to calculating the fees.

A marked-up version of the amended claims is attached and entitled *Version Showing Changes Made*.

IN THE CLAIMS

Please amend claims 7-11 and 17-20 as follows:

7. System for the implementation of telephone services according to claim 1, characterized in that the interface comprises one or more analog or digital modems and a coupler used to connect this modem or these modems to the computer link.

8. System for the implementation of telephone services according to claim 1, characterized in that the driving of the automatic branch exchange by the server is secured by an authentication procedure or by the enciphering of the messages sent, between the CTI server (40) and the interface (300).

9. System for the implementation of telephone services according to claim 1, characterized in that the telephone lines connecting an interface to one or more automatic branch exchanges are analog or digital lines.

10. System for the implementation of telephone services according to claim 1, characterized in that the interface takes the form of packs.

11. System for the implementation of telephone services according to claim 1, characterized in that the signalling control signals are DTMF or ISDN or voice signals.

17. Control device for an automatic branch exchange according to claim 15, characterized in that the telephone lines connecting the interface to the automatic branch exchange are analog or digital lines.

18. Control device for an automatic branch exchange according to claim 15, characterized in that the telephone interface comprises one or more analog or digital modems and a coupler used to connect this modem or these modems to the computer link.

19. Control device for an automatic branch exchange according to claim 15, characterized in that the interface takes the form of packs.

20. Control device for an automatic branch exchange according to claim 15, characterized in that the signalling control signals are DTMF or ISDN or voice signals.

REMARKS

Claims 1-20 are pending in this application. Claims 7-11 and 16-20 have been amended to eliminate their multiple dependencies. Entry of the amendments and early consideration and allowance are respectfully requested.

Respectfully submitted,

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Version Showing Changes Made

CLAIMS

7. System for the implementation of telephone services according to [any of the above claims] claim 1, characterized in that the interface comprises one or more analog or digital modems and a coupler used to connect this modem or these modems to the computer link.

8. System for the implementation of telephone services according to [any of the above claims] claim 1, characterized in that the driving of the automatic branch exchange by the server is secured by an authentication procedure or by the enciphering of the messages sent, between the CTI server (40) and the interface (300).

9. System for the implementation of telephone services according to [any of the above claims] claim 1, characterized in that the telephone lines connecting an interface to one or more automatic branch exchanges are analog or digital lines.

10. System for the implementation of telephone services according to [any of the above claims] claim 1, characterized in that the interface takes the form of packs.

11. System for the implementation of telephone services according to [any of the above claims] claim 1, characterized in that the signalling control signals are DTMF or ISDN or voice signals.

17. Control device for an automatic branch exchange according to [any of the claims 15 to 16] claim 15, characterized in that the telephone lines connecting the interface to the automatic branch exchange are analog or digital lines.

18. Control device for an automatic branch exchange according to [any of the claims 15 to 17] claim 15, characterized in that the telephone interface comprises one or more analog or digital modems and a coupler used to connect this modem or these modems to the computer link.

19. Control device for an automatic branch exchange according to [any of the claims 15 to 18] claim 15, characterized in that the interface takes the form of packs.

20. Control device for an automatic branch exchange according to [any of the claims 15 to 19] claim 15, characterized in that the signalling control signals are DTMF or ISDN or voice signals.

SYSTEM FOR IMPLEMENTING TELEPHONE SERVICES, AUTOMATIC BRANCH EXCHANGE CONTROL DEVICE AND CTI SERVER

BACKGROUND OF THE INVENTION

The invention relates to a system for implementing telephone services in one or more telephone installations comprising several telephone terminals managed by at least one private automatic branch exchange. This also relates to a control device for an automatic branch exchange and a CTI server.

The invention can be applied to services offered by systems known as CTI systems or computer telephony integration systems.

These are services that can presently be offered only to installations having recent-model automatic branch exchanges with a CTI link.

It may be recalled that a private automatic branch exchange is also known by the abbreviation PABX.

Furthermore, the term telephone terminal refers to any piece of equipment or telephone set used to access the switched telephone network (STN).

Figure 1 is a drawing of a system offering computer telephony integration services according to the recent prior art.

There is thus a telephone installation 1 comprising telephone terminals 10 and a recent-generation automatic branch exchange 20 connected firstly to the switched telephone network STN and, secondly, to a piece of computer equipment 30 by means of a CTI link. This site also has telecommunications equipment 11A, 11B, 11C (computer equipment for example) connected by a telecommunications network to a voice telecommunications server and/or to a WEB server 50.

An authorized user who, by virtue of this fact, possesses a secret key to access the services rendered by the CTI server 30 may request these services by means of the pieces of equipment 11A or 11B if he is at the site on which the PABX 20 is installed. However, he can also request these services from outside using a piece of equipment 11C to access the CTI server through the voice server and/or the WEB site 50.

A CTI link generally complies with a standard protocol used in the market but this protocol is adapted and interpreted differently from one builder to another. Secondly, this link evolves for a given PABX with the different versions of PABX.

This implies that the CTI server must propose management systems (or drivers) by model and by version of PABX.

The management of a CTI server therefore becomes difficult and the updating operations are frequent. Furthermore, the CTI links do not always take the telephone call transfer function and the CTI server drives only one PABX at a time.

The computer equipment 30 is connected to a remote server used to offer telecommunications services.

The link between the computer equipment 30 and the server 50 is obtained through a computer network on which the communications protocol used is the TCP/IP protocol.

To date, there are few systems of the kind just described. These are indeed systems by which it is possible to provide relatively recent-generation services. Only the new generation automatic branch exchanges possess this possibility of having a computer telephony integration link with a piece of computer equipment.

The use of such CTI links proposed by PABX manufacturers in order to create certain telephone services are generally costly and their implementation differs from one PABX to another. Furthermore, as has just been pointed out, the CTI link is available only on recent-generation PABX devices.

OBJECTS AND SUMMARY OF THE INVENTION

The present invention is therefore aimed at offering fully secured CTI (computer telephony integration) services at low cost on any telephone installation, without its being necessary to use recent-generation PABXs. These CTI services may be provided by means of a single CTI server on one or more different telephone installations through an interface connected to each telephone network.

The invention also lowers costs if there is a recent-generation PABX available since it is not necessary, with the system proposed by the present invention, to use a CTI link, which is a particularly costly link.

An object of the invention therefore is a system for implementing telephone services on one or more telephone installations themselves comprising several telephone terminals managed by one or more private automatic branch exchanges, characterized chiefly in that said system comprises a piece of server type computer equipment, accessible by a computer network, and one or more interfaces capable of sending signalling control signals corresponding to the services requested to drive one or more automatic branch exchanges, these interfaces being connected for this purpose to telephone lines of automatic branch exchanges.

The telephone service commands sent by the server are call transfer and automatic call-back commands or services pertaining to incoming calls.

Indeed, according to another characteristic of the invention, the telephone service requested may be the programming of call transfers of an automatic branch exchange station.

The call transfer is an automatic transfer of calls addressed to a telephone terminal of an installation to another terminal of this installation or to a terminal external to this installation.

According to another characteristic of the invention, the telephone service requested may be the automatic calling back of a terminal of the calling party in order to connect it with a called terminal.

The terminal of the calling party may be a terminal internal or external to a telephone installation and the called terminal may be a terminal internal or external to this telephone installation.

The driving of the interfaces connected with the automatic branch exchanges by the CTI server is secured by an authentication procedure or by the enciphering of the messages sent.

An object of the invention is also a telecommunications server (CTI) characterized chiefly in that it is connected to one or more private automatic branch exchanges (PABX) by means of a computer link through at least one interface connected by telephone lines to said automatic branch exchange or exchanges in order to drive this automatic branch exchange or these automatic branch exchanges to obtain telephone services, said automatic branch exchanges possibly being of different technologies.

The interface or interfaces are capable of generating signals corresponding to telephone service commands received from the server.

The invention also relates to a device for controlling a private automatic branch exchange (PABX) characterized chiefly in that it uses the telephone lines of the automatic branch exchange to convey signals corresponding to telephone service commands.

This device comprises an interface capable of sending signalling control signals on the telephone lines of at least one automatic branch exchange.

The control device is connected to a telecommunications server by a computer link to receive telephone service commands through this link.

The interface comprises one or more analog or digital modems and a coupler used to connect this modem or these modems to the computer link.

According to another characteristic, the interface takes the form of packs and this interface is secured.

The telephone lines connecting the interface to an automatic branch exchange are analog or digital lines.

The signalling control signals are DTMF or ISDN or voice signals.

Thus, the system proposed by the invention enables fully secured access to a telecommunications service on PABX by using an economical interface including analog or digital modems connected to a number of analog or digital channels (ISDN lines) of the PABX. This interface is driven through the IP protocol in fully secured mode. It can be used to provide remote transfer functions for stations that are in the installations and are driven by the PABX, and also the automatic call-back function for example through a distant WEB server, of the PABXs, etc.

It can also be used to provide incoming services (incoming calls) used for example for the dynamic assigning of an incoming call, addressed to a user, or a particular service, to a number or a list of numbers derived from the user profile stored for example in a database.

Indeed, the interface can be used in a large majority of the PABXs in the market without requiring that the client using the installation should purchase CTI links which are often costly.

Through the use of this interface, functions such as the programming of transfers from telephone sets in the installation managed by the PABX, the automatic call-back of a terminal of the calling party to connect him with a called terminal as well as the management of the incoming calls can be carried out remotely for a moderate cost.

A CTI server can drive one or more interfaces, each of them being connected to one or more PABXs.

BRIEF DESCRIPTION OF THE DRAWINGS

Other features and advantages of the invention shall appear more clearly from the following description made by way of a non-restrictive illustration and with reference to the appended drawings, of which:

- Figure 1 shows a computer telephony integration system according to the prior art for the implementation of telephone services according to the invention;

- Figure 2A shows a system for the implementation of the telephone services according to the present invention;

- Figure 2B shows a system according to the invention implemented and illustrating a telephone installation in greater detail;

- Figure 3 shows a detail of an embodiment of an interface 300.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

A control device 300 can be used as shown in Figure 2A to drive one or more automatic branch exchanges 20 through telephone lines L1, ..., Ln. It is connected for this purpose with a telecommunications server (CTI server) 40 by a computer link In. The server may be connected to several devices 300 by computer links.

In practice, as can be seen in Figure 2B, this device is a computer telephony integration (CTI) interface 300 made in the form of packs that are connected to the automatic branch exchange 20 by one or more analog or digital telephone lines L1, Ln available on this automatic branch exchange and to a remote CTI server type computer device 40 by a computer network.

The link between the CTI server 40 and the interfaces 300 is preferably secured. The securing of the link is done for example by any known enciphering algorithm. The exchanges are done according to the TCP/IP protocol.

The interface 300 is capable of configuring the PABX to enable the service for programming remote transfers from a telecommunications terminal or telephone set of the installation, managed by this PABX (the automatic branch exchange 20).

For this purpose, the interface generates for example a DTMF (Dual Tone Multifrequency) sequence or an ISDN sequence or a voice sequence corresponding to the control signals received from the CTI server to program the PABX according to the service required.

This remote telephone transfer function is useful in the telecommuting context.

The interface 300 is therefore connected to a few analog channels (or digital channels) V1 to Vn of the PABX 20.

The remote server 40 drives one or more interfaces 300 according to the secured IP protocol, using a conventional technique that is recalled here above.

The control parameters that will be sent in the case of this function will be the number of the telephone set whose call is to be transferred (managed by the PABX), the telephone number of the transfer, the confidential code of the telephone set of the user entitled to the service, the PABX telephone set substitution code and the PABX transfer codes.

Another possible service is the automatic call-back function used to connect the caller and the called party, by which it is possible to get called back if a user is outside or inside the company premises and if this user wishes to call a telephone inside or outside the PABX of the company.

In this case, the CTI server 40 drives an interface so that the interface first of all calls the requesting party and then makes a double call to call the requested number and then carries out either a transfer or a conferencing operation.

In the case of a conferencing operation, the interface may be silent and may also stop the calls since it controls the line.

This service can advantageously be used to request on-line services in the event of a teleconference, for example by sending DTMF codes during communication.

Other services can also be envisaged such as getting called back to listen to voice messages synthesized by the interface from the telephone installation 1 which houses the interface or getting called back to record a voice message. In this case, of course, the person who is called back will not incur the costs of communication. These costs will be transferred to those of the telephone installation of the company in which the telephone unit that is calling back is installed.

This system can also be used to provide incoming services on incoming calls, enabling the assigning of these calls to a number or a list of numbers internal or external to the PABX. This assigning can be done dynamically, through the interface and the CTI server. The digital lines connected to the interface can make this service even more speedy and efficient.

Another service may consist of the use of this interface to synchronize the call transfer requests programmed for a telephone number on an operator's smart network and for the telephone set of this user on PABX for calls internal to the PABX or to the PABX network.

The interface 300 therefore comprises, as stated here above, a set of one or more analog and/or digital modems 301 respectively connected to one or more analog or digital lines L1-Ln connected to the PABX. This modem or these modems are connected to a standardized RS232 coupler 302 including a processor 303 capable of deciphering the messages received or enciphering the messages sent thus providing a secured computer type link in order to connect the interface to the CTI server.

A detailed description shall now be given of an exemplary request for programming telephone call transfers made by an authorized user.

If the user is on the site of the telephone installation, he will request this call transfer, for example from the telecommunications equipment 11A or 11B which is available to him and which he can use to access a WEB site or a voice server. Should the user be outside the site of the installation, then he can make his requests from an external unit of telecommunications equipment giving him access to the WEB site or the voice server 50.

Typically, the user must send his identification, the number of the telephone set from which he wishes to transfer calls, the number of the telephone set to which the calls will be transferred, and his confidential code in order to verify the fact that he is an authorized person, and he must validate his request.

The CTI server receiving this request through the WEB site 50 (or voice server) sends secured control signals (enciphered or certified) on the TCP/IP link for the interface 300.

These commands comprise:

- the PABX station substitution code,
- the number of the telephone set from which calls are to be transferred;
- the user's confidential code on the PABX,
- the transfer code or command,
- the transfer number,
- the command for disconnecting the analog line used by the interface.

The interface generates a corresponding DTMF or voice sequence used to configure the PABX.

In the case of an automatic calling back, the CTI server will drive the interface by sending it the following commands:

- the caller's (user's) number,
- the detection of the off-hook status of the caller,
- the making of a double call with the number of called party,
- disconnection or transfer of the line used by the interface. The calling party is connected with the called party.

In the case of an automatic calling back, the CTI server will drive the interface by sending it the following commands

CLAIMS

1. System for implementing telephone services on one or more telephone installations, themselves comprising several telephone terminals managed by one or more private automatic branch exchanges (20), characterized in that it comprises a piece of server type computer equipment, accessible by a computer network, and one or more interfaces (300) capable of sending signalling control signals corresponding to the service or services requested to drive one or more automatic branch exchanges, these interfaces being connected for this purpose to telephone lines (L1, Ln) of the automatic branch exchanges and by a computer link (In) to the server (40).

2. System for the implementation of telephone services according to claim 1, characterized in that the telephone service requested is a programming of a transfer from a station of the installation.

3. System for the implementation of telephone services according to claim 2, characterized in that the call transfer is an automatic transfer, of the calls addressed to a telephone terminal of an installation, to another terminal of this installation or to a terminal external to this installation.

4. System for the implementation of telephone services according to claim 1 characterized in that the telephone service requested is the automatic calling back of a terminal of the calling party in order to connect it with a called terminal.

5. System for the implementation of telephone services according to claim 4, characterized in that calling terminal is a terminal of a telephone installation or external terminal and in that the called terminal is a telephone terminal internal or external to this installation.

6. System for the implementation of telephone services, according to claim 1, characterized in that the telephone service is the management of the incoming calls, for subscribers to the PABXs or for a particular service.

7. System for the implementation of telephone services according to claim 1, characterized in that the interface comprises one or more analog or digital modems and a coupler used to connect this modem or these modems to the computer link.

8. System for the implementation of telephone services according to claim 1, characterized in that the driving of the automatic branch exchange by the server is secured by an authentication procedure or by the enciphering of the messages sent, between the CTI server (40) and the interface (300).

9. System for the implementation of telephone services according to claim 1, characterized in that the telephone lines connecting an interface to one or more automatic branch exchanges are analog or digital lines.

10. System for the implementation of telephone services according to claim 1, characterized in that the interface takes the form of packs.

11. System for the implementation of telephone services according to claim 1, characterized in that the signalling control signals are DTMF or ISDN or voice signals.

12. Telecommunications server (CTI), according to claim 1, characterized in that it is connected to one or more private automatic branch exchanges (PABX) by means of a computer link through at least one interface connected by telephone lines to said automatic branch exchange or exchanges in order to drive this automatic branch exchange or these automatic branch exchanges to obtain telephone services, said automatic branch exchanges possibly being of different technologies.

13. Telecommunications server (CTI) according to claim 12, characterized in that the interface or interfaces are capable of generating signals corresponding to telephone service commands.

14. Telecommunications server, according to claim 13, characterized in that the telephone service commands are call transfers or automatic calling-back operations or services pertaining to incoming calls.

15. Control device for a private automatic branch exchange (PABX), characterized in that it comprises a telephone interface (301) connected to telephone lines of the automatic branch exchange to convey signals corresponding to telephone service commands and a computer interface comprising a processor (303) to provide a link with a CTI server and convert the commands/signals between CTI server and the switch..

16. Control device for a private automatic branch exchange (PABX) according to claim 15, characterized in that the signalling control signals are DTMF or ISDN or voice signals.

17. Control device for an automatic branch exchange according to claim 15, characterized in that the telephone lines connecting the interface to the automatic branch exchange are analog or digital lines.

18. Control device for an automatic branch exchange according to claim 15, characterized in that the telephone interface comprises one or more analog or digital

modems and a coupler used to connect this modem or these modems to the computer link.

19. Control device for an automatic branch exchange according to claim 15, characterized in that the interface takes the form of packs.

20. Control device for an automatic branch exchange according to claim 15, characterized in that the signalling control signals are DTMF or ISDN or voice signals..

ABSTRACT

A system for implementing telephone services on one or more telephone installations, themselves having several telephone terminals managed by one or more private automatic branch exchanges. To this end, the system has a piece of server type computer equipment, accessible by a computer network, and one or more interfaces capable of sending signaling control signals corresponding to the service or services requested to drive one or more automatic branch exchanges, these interfaces being connected for this purpose to telephone lines of the automatic branch exchanges.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

SYSTEM FOR IMPLEMENTING TELEPHONE SERVICES, AUTOMATIC BRANCH EXCHANGE CONTROL DEVICE AND CTI SERVER

BACKGROUND OF THE INVENTION

The invention relates to a system for implementing telephone services in one or more telephone installations comprising several telephone terminals managed by at least one private automatic branch exchange. This also relates to a control device for an automatic branch exchange and a CTI server.

The invention can be applied to services offered by systems known as CTI systems or computer telephony integration systems.

These are services that can presently be offered only to installations having recent-model automatic branch exchanges with a CTI link.

It may be recalled that a private automatic branch exchange is also known by the abbreviation PABX.

Furthermore, the term telephone terminal refers to any piece of equipment or telephone set used to access the switched telephone network (STN).

Figure 1 is a drawing of a system offering computer telephony integration services according to the recent prior art.

There is thus a telephone installation 1 comprising telephone terminals 10 and a recent-generation automatic branch exchange 20 connected firstly to the switched telephone network STN and, secondly, to a piece of computer equipment 30 by means of a CTI link. This site also has telecommunications equipment 11A, 11B, 11C (computer equipment for example) connected by a telecommunications network to a voice telecommunications server and/or to a WEB server 50.

An authorized user who, by virtue of this fact, possesses a secret key to access the services rendered by the CTI server 30 may request these services by means of the pieces of equipment 11A or 11B if he is at the site on which the PABX 20 is installed. However, he can also request these services from outside using a piece of equipment 11C to access the CTI server through the voice server and/or the WEB site 50.

A CTI link generally complies with a standard protocol used in the market but this protocol is adapted and interpreted differently from one builder to another. Secondly, this link evolves for a given PABX with the different versions of PABX.

This implies that the CTI server must propose management systems (or drivers) by model and by version of PABX.

The management of a CTI server therefore becomes difficult and the updating operations are frequent. Furthermore, the CTI links do not always take the telephone call transfer function and the CTI server drives only one PABX at a time.

The computer equipment 30 is connected to a remote server used to offer telecommunications services.

The link between the computer equipment 30 and the server 50 is obtained through a computer network on which the communications protocol used is the TCP/IP protocol.

To date, there are few systems of the kind just described. These are indeed systems by which it is possible to provide relatively recent-generation services. Only the new generation automatic branch exchanges possess this possibility of having a computer telephony integration link with a piece of computer equipment.

The use of such CTI links proposed by PABX manufacturers in order to create certain telephone services are generally costly and their implementation differs from one PABX to another. Furthermore, as has just been pointed out, the CTI link is available only on recent-generation PABX devices.

OBJECTS AND SUMMARY OF THE INVENTION

The present invention is therefore aimed at offering fully secured CTI (computer telephony integration) services at low cost on any telephone installation, without its being necessary to use recent-generation PABXs. These CTI services may be provided by means of a single CTI server on one or more different telephone installations through an interface connected to each telephone network.

The invention also lowers costs if there is a recent-generation PABX available since it is not necessary, with the system proposed by the present invention, to use a CTI link, which is a particularly costly link.

An object of the invention therefore is a system for implementing telephone services on one or more telephone installations themselves comprising several telephone terminals managed by one or more private automatic branch exchanges, characterized chiefly in that said system comprises a piece of server type computer equipment, accessible by a computer network, and one or more interfaces capable of sending signalling control signals corresponding to the services requested to drive one or more automatic branch exchanges, these interfaces being connected for this purpose to telephone lines of automatic branch exchanges.

The telephone service commands sent by the server are call transfer and automatic call-back commands or services pertaining to incoming calls.

Indeed, according to another characteristic of the invention, the telephone service requested may be the programming of call transfers of an automatic branch exchange station.

The call transfer is an automatic transfer of calls addressed to a telephone terminal of an installation to another terminal of this installation or to a terminal external to this installation.

According to another characteristic of the invention, the telephone service requested may be the automatic calling back of a terminal of the calling party in order to connect it with a called terminal.

The terminal of the calling party may be a terminal internal or external to a telephone installation and the called terminal may be a terminal internal or external to this telephone installation.

The driving of the interfaces connected with the automatic branch exchanges by the CTI server is secured by an authentication procedure or by the enciphering of the messages sent.

An object of the invention is also a telecommunications server (CTI) characterized chiefly in that it is connected to one or more private automatic branch exchanges (PABX) by means of a computer link through at least one interface connected by telephone lines to said automatic branch exchange or exchanges in order to drive this automatic branch exchange or these automatic branch exchanges to obtain telephone services, said automatic branch exchanges possibly being of different technologies.

The interface or interfaces are capable of generating signals corresponding to telephone service commands received from the server.

The invention also relates to a device for controlling a private automatic branch exchange (PABX) characterized chiefly in that it uses the telephone lines of the automatic branch exchange to convey signals corresponding to telephone service commands.

This device comprises an interface capable of sending signalling control signals on the telephone lines of at least one automatic branch exchange.

The control device is connected to a telecommunications server by a computer link to receive telephone service commands through this link.

The interface comprises one or more analog or digital modems and a coupler used to connect this modem or these modems to the computer link.

According to another characteristic, the interface takes the form of packs and this interface is secured.

The telephone lines connecting the interface to an automatic branch exchange are analog or digital lines.

The signalling control signals are DTMF or ISDN or voice signals.

Thus, the system proposed by the invention enables fully secured access to a telecommunications service on PABX by using an economical interface including analog or digital modems connected to a number of analog or digital channels (ISDN lines) of the PABX. This interface is driven through the IP protocol in fully secured mode. It can be used to provide remote transfer functions for stations that are in the installations and are driven by the PABX, and also the automatic call-back function for example through a distant WEB server, of the PABXs, etc.

It can also be used to provide incoming services (incoming calls) used for example for the dynamic assigning of an incoming call, addressed to a user, or a particular service, to a number or a list of numbers derived from the user profile stored for example in a database.

Indeed, the interface can be used in a large majority of the PABXs in the market without requiring that the client using the installation should purchase CTI links which are often costly.

Through the use of this interface, functions such as the programming of transfers from telephone sets in the installation managed by the PABX, the automatic call-back of a terminal of the calling party to connect him with a called terminal as well as the management of the incoming calls can be carried out remotely for a moderate cost.

A CTI server can drive one or more interfaces, each of them being connected to one or more PABXs.

BRIEF DESCRIPTION OF THE DRAWINGS

Other features and advantages of the invention shall appear more clearly from the following description made by way of a non-restrictive illustration and with reference to the appended drawings, of which:

- Figure 1 shows a computer telephony integration system according to the prior art for the implementation of telephone services according to the invention;

- Figure 2A shows a system for the implementation of the telephone services according to the present invention;

- Figure 2B shows a system according to the invention implemented and illustrating a telephone installation in greater detail;

- Figure 3 shows a detail of an embodiment of an interface 300.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

A control device 300 can be used as shown in Figure 2A to drive one or more automatic branch exchanges 20 through telephone lines L1, ..., Ln. It is connected for this purpose with a telecommunications server (CTI server) 40 by a computer link In. The server may be connected to several devices 300 by computer links.

In practice, as can be seen in Figure 2B, this device is a computer telephony integration (CTI) interface 300 made in the form of packs that are connected to the automatic branch exchange 20 by one or more analog or digital telephone lines L1, Ln available on this automatic branch exchange and to a remote CTI server type computer device 40 by a computer network.

The link between the CTI server 40 and the interfaces 300 is preferably secured. The securing of the link is done for example by any known enciphering algorithm. The exchanges are done according to the TCP/IP protocol.

The interface 300 is capable of configuring the PABX to enable the service for programming remote transfers from a telecommunications terminal or telephone set of the installation, managed by this PABX (the automatic branch exchange 20).

For this purpose, the interface generates for example a DTMF (Dual Tone Multifrequency) sequence or an ISDN sequence or a voice sequence corresponding to the control signals received from the CTI server to program the PABX according to the service required.

This remote telephone transfer function is useful in the telecommuting context.

The interface 300 is therefore connected to a few analog channels (or digital channels) V1 to Vn of the PABX 20.

The remote server 40 drives one or more interfaces 300 according to the secured IP protocol, using a conventional technique that is recalled here above.

The control parameters that will be sent in the case of this function will be the number of the telephone set whose call is to be transferred (managed by the PABX), the telephone number of the transfer, the confidential code of the telephone set of the

user entitled to the service, the PABX telephone set substitution code and the PABX transfer codes.

Another possible service is the automatic call-back function used to connect the caller and the called party, by which it is possible to get called back if a user is outside or inside the company premises and if this user wishes to call a telephone inside or outside the PABX of the company.

In this case, the CTI server 40 drives an interface so that the interface first of all calls the requesting party and then makes a double call to call the requested number and then carries out either a transfer or a conferencing operation.

In the case of a conferencing operation, the interface may be silent and may also stop the calls since it controls the line.

This service can advantageously be used to request on-line services in the event of a teleconference, for example by sending DTMF codes during communication.

Other services can also be envisaged such as getting called back to listen to voice messages synthesized by the interface from the telephone installation 1 which houses the interface or getting called back to record a voice message. In this case, of course, the person who is called back will not incur the costs of communication. These costs will be transferred to those of the telephone installation of the company in which the telephone unit that is calling back is installed.

This system can also be used to provide incoming services on incoming calls, enabling the assigning of these calls to a number or a list of numbers internal or external to the PABX. This assigning can be done dynamically, through the interface and the CTI server. The digital lines connected to the interface can make this service even more speedy and efficient.

Another service may consist of the use of this interface to synchronize the call transfer requests programmed for a telephone number on an operator's smart network and for the telephone set of this user on PABX for calls internal to the PABX or to the PABX network.

The interface 300 therefore comprises, as stated here above, a set of one or more analog and/or digital modems 301 respectively connected to one or more analog or digital lines L1-Ln connected to the PABX. This modem or these modems are connected to a standardized RS232 coupler 302 including a processor 303 capable of deciphering the messages received or enciphering the messages sent thus

providing a secured computer type link in order to connect the interface to the CTI server.

A detailed description shall now be given of an exemplary request for programming telephone call transfers made by an authorized user.

If the user is on the site of the telephone installation, he will request this call transfer, for example from the telecommunications equipment 11A or 11B which is available to him and which he can use to access a WEB site or a voice server. Should the user be outside the site of the installation, then he can make his requests from an external unit of telecommunications equipment giving him access to the WEB site or the voice server 50.

Typically, the user must send his identification, the number of the telephone set from which he wishes to transfer calls, the number of the telephone set to which the calls will be transferred, and his confidential code in order to verify the fact that he is an authorized person, and he must validate his request.

The CTI server receiving this request through the WEB site 50 (or voice server) sends secured control signals (enciphered or certified) on the TCP/IP link for the interface 300.

These commands comprise:

- the PABX station substitution code,
- the number of the telephone set from which calls are to be transferred;
- the user's confidential code on the PABX,
- the transfer code or command,
- the transfer number,
- the command for disconnecting the analog line used by the interface.

The interface generates a corresponding DTMF or voice sequence used to configure the PABX.

In the case of an automatic calling back, the CTI server will drive the interface by sending it the following commands:

- the caller's (user's) number,
- the detection of the off-hook status of the caller,
- the making of a double call with the number of called party,
- disconnection or transfer of the line used by the interface. The calling party is connected with the called party.

In the case of an automatic calling back, the CTI server will drive the interface by sending it the following commands

CLAIMS

1. System for implementing telephone services on one or more telephone installations, themselves comprising several telephone terminals managed by one or more private automatic branch exchanges (20), characterized in that it comprises a piece of server type computer equipment, accessible by a computer network, and one or more interfaces (300) capable of sending signalling control signals corresponding to the service or services requested to drive one or more automatic branch exchanges, these interfaces being connected for this purpose to telephone lines (L1, Ln) of the automatic branch exchanges and by a computer link (In) to the server (40).

2. System for the implementation of telephone services according to claim 1, characterized in that the telephone service requested is a programming of a transfer from a station of the installation.

3. System for the implementation of telephone services according to claim 2, characterized in that the call transfer is an automatic transfer, of the calls addressed to a telephone terminal of an installation, to another terminal of this installation or to a terminal external to this installation.

4. System for the implementation of telephone services according to claim 1 characterized in that the telephone service requested is the automatic calling back of a terminal of the calling party in order to connect it with a called terminal.

5. System for the implementation of telephone services according to claim 4, characterized in that calling terminal is a terminal of a telephone installation or external terminal and in that the called terminal is a telephone terminal internal or external to this installation.

6. System for the implementation of telephone services, according to claim 1, characterized in that the telephone service is the management of the incoming calls, for subscribers to the PABXs or for a particular service.

7. System for the implementation of telephone services according to [any of the above claims] claim 1, characterized in that the interface comprises one or more analog or digital modems and a coupler used to connect this modem or these modems to the computer link.

8. System for the implementation of telephone services according to [any of the above claims] claim 1, characterized in that the driving of the automatic branch exchange by the server is secured by an authentication procedure or by the enciphering of the messages sent, between the CTI server (40) and the interface (300).

9. System for the implementation of telephone services according to [any of the above claims] claim 1, characterized in that the telephone lines connecting an interface to one or more automatic branch exchanges are analog or digital lines.

10. System for the implementation of telephone services according to [any of the above claims] claim 1, characterized in that the interface takes the form of packs.

11. System for the implementation of telephone services according to [any of the above claims] claim 1, characterized in that the signalling control signals are DTMF or ISDN or voice signals.

12. Telecommunications server (CTI), according to claim 1, characterized ~~chiefly~~ in that it is connected to one or more private automatic branch exchanges (PABX) by means of a computer link through at least one interface connected by telephone lines to said automatic branch exchange or exchanges in order to drive this automatic branch exchange or these automatic branch exchanges to obtain telephone services, said automatic branch exchanges possibly being of different technologies.

13. Telecommunications server (CTI) according to claim 12, characterized in that the interface or interfaces are capable of generating signals corresponding to telephone service commands.

14. Telecommunications server, according to claim 13, characterized in that the telephone service commands are call transfers or automatic calling-back operations or services pertaining to incoming calls.

15. Control device for a private automatic branch exchange (PABX), characterized in that it ~~uses~~ comprises a telephone interface (301) connected to telephone lines of the automatic branch exchange to convey signals corresponding to telephone service commands and a computer interface comprising a processor (303) to provide a link with a CTI server and convert the commands/signals between CTI server and the switch..

~~16. Control device for a private automatic branch exchange (PABX) according to claim 15, characterized in that it comprises an interface capable of sending signaling control signals on telephone lines of the automatic branch exchange.~~

16~~7~~. Control device for a private automatic branch exchange (PABX) according to claim ~~16~~15, characterized in that the signalling control signals are DTMF or ISDN or voice signals.

~~18. Control device for a private automatic branch exchange (PABX) according to any of the claims 15 to 17, characterized in that it is connected to a~~

~~telecommunications server by a computer link to receive telephone service commands through this link.~~

~~19~~17. Control device for an automatic branch exchange [according to any of the claims 15 to ~~18~~16] claim 15, characterized in that the telephone lines connecting the interface to the automatic branch exchange are analog or digital lines.

~~20~~18. Control device for an automatic branch exchange according to [any of the claims 15 to ~~19~~17] claim 15, characterized in that the telephone interface comprises one or more analog or digital modems and a coupler used to connect this modem or these modems to the computer link.

~~21~~19. Control device for an automatic branch exchange according to [any of the claims 15 to ~~20~~18] claim 15, characterized in that the interface takes the form of packs.

~~22~~20. Control device for an automatic branch exchange according to [any of the claims 15 to ~~21~~19] claim 15, characterized in that the signalling control signals are DTMF or ISDN or voice signals..

SYSTEM FOR IMPLEMENTING TELEPHONE SERVICES, AUTOMATIC BRANCH EXCHANGE CONTROL DEVICE AND CTI SERVER

The invention relates to a system for implementing telephone services in one or more telephone installations comprising several telephone terminals managed by at least one private automatic branch exchange. This also relates to a control device for an automatic branch exchange and a CTI server.

The invention can be applied to services offered by systems known as CTI systems or computer telephony integration systems.

These are services that can presently be offered only to installations having recent-model automatic branch exchanges with a CTI link.

It may be recalled that a private automatic branch exchange is also known by the abbreviation PABX.

Furthermore, the term telephone terminal refers to any piece of equipment or telephone set used to access the switched telephone network (STN).

Figure 1 is a drawing of a system offering computer telephony integration services according to the recent prior art.

There is thus a telephone installation 1 comprising telephone terminals 10 and a recent-generation automatic branch exchange 20 connected firstly to the switched telephone network STN and, secondly, to a piece of computer equipment 30 by means of a CTI link. This site also has telecommunications equipment 11A, 11B, 11C (computer equipment for example) connected by a telecommunications network to a voice telecommunications server and/or to a WEB server 50.

An authorized user who, by virtue of this fact, possesses a secret key to access the services rendered by the CTI server 30 may request these services by means of the pieces of equipment 11A or 11B if he is at the site on which the PABX 20 is installed. However, he can also request these services from outside using a piece of equipment 11C to access the CTI server through the voice server and/or the WEB site 50.

A CTI link generally complies with a standard protocol used in the market but this protocol is adapted and interpreted differently from one builder to another. Secondly, this link evolves for a given PABX with the different versions of PABX.

This implies that the CTI server must propose management systems (or drivers) by model and by version of PABX.

The management of a CTI server therefore becomes difficult and the updating operations are frequent. Furthermore, the CTI links do not always take the telephone call transfer function and the CTI server drives only one PABX at a time.

The computer equipment 30 is connected to a remote server used to offer telecommunications services.

The link between the computer equipment 30 and the server 50 is obtained through a computer network on which the communications protocol used is the TCP/IP protocol.

To date, there are few systems of the kind just described. These are indeed systems by which it is possible to provide relatively recent-generation services. Only the new generation automatic branch exchanges possess this possibility of having a computer telephony integration link with a piece of computer equipment.

The use of such CTI links proposed by PABX manufacturers in order to create certain telephone services are generally costly and their implementation differs from one PABX to another. Furthermore, as has just been pointed out, the CTI link is available only on recent-generation PABX devices.

The present invention is therefore aimed at offering fully secured CTI (computer telephony integration) services at low cost on any telephone installation, without its being necessary to use recent-generation PABXs. These CTI services may be provided by means of a single CTI server on one or more different telephone installations through an interface connected to each telephone network.

The invention also lowers costs if there is a recent-generation PABX available since it is not necessary, with the system proposed by the present invention, to use a CTI link, which is a particularly costly link.

An object of the invention therefore is a system for implementing telephone services on one or more telephone installations themselves comprising several telephone terminals managed by one or more private automatic branch exchanges, characterized chiefly in that said system comprises a piece of server type computer equipment, accessible by a computer network, and one or more interfaces capable of sending signalling control signals corresponding to the services requested to drive one or more automatic branch exchanges, these interfaces being connected for this purpose to telephone lines of automatic branch exchanges.

The telephone service commands sent by the server are call transfer and automatic call-back commands or services pertaining to incoming calls.

Indeed, according to another characteristic of the invention, the telephone service requested may be the programming of call transfers of an automatic branch exchange station.

The call transfer is an automatic transfer of calls addressed to a telephone terminal of an installation to another terminal of this installation or to a terminal external to this installation.

According to another characteristic of the invention, the telephone service requested may be the automatic calling back of a terminal of the calling party in order to connect it with a called terminal.

The terminal of the calling party may be a terminal internal or external to a telephone installation and the called terminal may be a terminal internal or external to this telephone installation.

The driving of the interfaces connected with the automatic branch exchanges by the CTI server is secured by an authentication procedure or by the enciphering of the messages sent.

An object of the invention is also a telecommunications server (CTI) characterized chiefly in that it is connected to one or more private automatic branch exchanges (PABX) by means of a computer link through at least one interface connected by telephone lines to said automatic branch exchange or exchanges in order to drive this automatic branch exchange or these automatic branch exchanges to obtain telephone services, said automatic branch exchanges possibly being of different technologies.

The interface or interfaces are capable of generating signals corresponding to telephone service commands received from the server.

The invention also relates to a device for controlling a private automatic branch exchange (PABX) characterized chiefly in that it uses the telephone lines of the automatic branch exchange to convey signals corresponding to telephone service commands.

This device comprises an interface capable of sending signalling control signals on the telephone lines of at least one automatic branch exchange.

The control device is connected to a telecommunications server by a computer link to receive telephone service commands through this link.

The interface comprises one or more analog or digital modems and a coupler used to connect this modem or these modems to the computer link.

According to another characteristic, the interface takes the form of packs and this interface is secured.

The telephone lines connecting the interface to an automatic branch exchange are analog or digital lines.

The signalling control signals are DTMF or ISDN or voice signals.

Thus, the system proposed by the invention enables fully secured access to a telecommunications service on PABX by using an economical interface including analog or digital modems connected to a number of analog or digital channels (ISDN lines) of the PABX. This interface is driven through the IP protocol in fully secured mode. It can be used to provide remote transfer functions for stations that are in the installations and are driven by the PABX, and also the automatic call-back function for example through a distant WEB server, of the PABXs, etc.

It can also be used to provide incoming services (incoming calls) used for example for the dynamic assigning of an incoming call, addressed to a user, or a particular service, to a number or a list of numbers derived from the user profile stored for example in a database.

Indeed, the interface can be used in a large majority of the PABXs in the market without requiring that the client using the installation should purchase CTI links which are often costly.

Through the use of this interface, functions such as the programming of transfers from telephone sets in the installation managed by the PABX, the automatic call-back of a terminal of the calling party to connect him with a called terminal as well as the management of the incoming calls can be carried out remotely for a moderate cost.

A CTI server can drive one or more interfaces, each of them being connected to one or more PABXs.

Other features and advantages of the invention shall appear more clearly from the following description made by way of a non-restrictive illustration and with reference to the appended drawings, of which:

- Figure 1 shows a computer telephony integration system according to the prior art for the implementation of telephone services according to the invention;

- Figure 2A shows a system for the implementation of the telephone services according to the present invention;

- Figure 2B shows a system according to the invention implemented and illustrating a telephone installation in greater detail;

- Figure 3 shows a detail of an embodiment of an interface 300.

A control device 300 can be used as shown in Figure 2A to drive one or more automatic branch exchanges 20 through telephone lines L1, ..., Ln. It is connected for this purpose with a telecommunications server (CTI server) 40 by a computer link In. The server may be connected to several devices 300 by computer links.

In practice, as can be seen in Figure 2B, this device is a computer telephony integration (CTI) interface 300 made in the form of packs that are connected to the automatic branch exchange 20 by one or more analog or digital telephone lines L1, Ln available on this automatic branch exchange and to a remote CTI server type computer device 40 by a computer network.

The link between the CTI server 40 and the interfaces 300 is preferably secured. The securing of the link is done for example by any known enciphering algorithm. The exchanges are done according to the TCP/IP protocol.

The interface 300 is capable of configuring the PABX to enable the service for programming remote transfers from a telecommunications terminal or telephone set of the installation, managed by this PABX (the automatic branch exchange 20).

For this purpose, the interface generates for example a DTMF (Dual Tone Multifrequency) sequence or an ISDN sequence or a voice sequence corresponding to the control signals received from the CTI server to program the PABX according to the service required.

This remote telephone transfer function is useful in the telecommuting context.

The interface 300 is therefore connected to a few analog channels (or digital channels) V1 to Vn of the PABX 20.

The remote server 40 drives one or more interfaces 300 according to the secured IP protocol, using a conventional technique that is recalled here above.

The control parameters that will be sent in the case of this function will be the number of the telephone set whose call is to be transferred (managed by the PABX), the telephone number of the transfer, the confidential code of the telephone set of the user entitled to the service, the PABX telephone set substitution code and the PABX transfer codes.

Another possible service is the automatic call-back function used to connect the caller and the called party, by which it is possible to get called back if a user is outside or inside the company premises and if this user wishes to call a telephone inside or outside the PABX of the company.

In this case, the CTI server 40 drives an interface so that the interface first of all calls the requesting party and then makes a double call to call the requested number and then carries out either a transfer or a conferencing operation.

In the case of a conferencing operation, the interface may be silent and may also stop the calls since it controls the line.

This service can advantageously be used to request on-line services in the event of a teleconference, for example by sending DTMF codes during communication.

Other services can also be envisaged such as getting called back to listen to voice messages synthesized by the interface from the telephone installation 1 which houses the interface or getting called back to record a voice message. In this case, of course, the person who is called back will not incur the costs of communication. These costs will be transferred to those of the telephone installation of the company in which the telephone unit that is calling back is installed.

This system can also be used to provide incoming services on incoming calls, enabling the assigning of these calls to a number or a list of numbers internal or external to the PABX. This assigning can be done dynamically, through the interface and the CTI server. The digital lines connected to the interface can make this service even more speedy and efficient.

Another service may consist of the use of this interface to synchronize the call transfer requests programmed for a telephone number on an operator's smart network and for the telephone set of this user on PABX for calls internal to the PABX or to the PABX network.

The interface 300 therefore comprises, as stated here above, a set of one or more analog and/or digital modems 301 respectively connected to one or more analog or digital lines L1-Ln connected to the PABX. This modem or these modems are connected to a standardized RS232 coupler 302 including a processor 303 capable of deciphering the messages received or enciphering the messages sent thus providing a secured computer type link in order to connect the interface to the CTI server.

A detailed description shall now be given of an exemplary request for programming telephone call transfers made by an authorized user.

If the user is on the site of the telephone installation, he will request this call transfer, for example from the telecommunications equipment 11A or 11B which is available to him and which he can use to access a WEB site or a voice server.

Should the user be outside the site of the installation, then he can make his requests from an external unit of telecommunications equipment giving him access to the WEB site or the voice server 50.

Typically, the user must send his identification, the number of the telephone set from which he wishes to transfer calls, the number of the telephone set to which the calls will be transferred, and his confidential code in order to verify the fact that he is an authorized person, and he must validate his request.

The CTI server receiving this request through the WEB site 50 (or voice server) sends secured control signals (enciphered or certified) on the TCP/IP link for the interface 300.

These commands comprise:

- the PABX station substitution code,
- the number of the telephone set from which calls are to be transferred;
- the user's confidential code on the PABX,
- the transfer code or command,
- the transfer number,
- the command for disconnecting the analog line used by the interface.

The interface generates a corresponding DTMF or voice sequence used to configure the PABX.

In the case of an automatic calling back, the CTI server will drive the interface by sending it the following commands:

- the caller's (user's) number,
- the detection of the off-hook status of the caller,
- the making of a double call with the number of called party,
- disconnection or transfer of the line used by the interface. The calling party is connected with the called party.

In the case of an automatic calling back, the CTI server will drive the interface by sending it the following commands

CLAIMS (as modified under Article 34)

1. System for implementing telephone services on one or more telephone installations, themselves comprising several telephone terminals managed by one or more private automatic branch exchanges (20), characterized in that it comprises a piece of server type computer equipment, accessible by a computer network, and one or more interfaces (300) capable of sending signalling control signals corresponding to the service or services requested to drive one or more automatic branch exchanges, these interfaces being connected for this purpose to telephone lines (L1, Ln) of the automatic branch exchanges and by a computer link (In) to the server (40).

2. System for the implementation of telephone services according to claim 1, characterized in that the telephone service requested is a programming of a transfer from a station of the installation.

3. System for the implementation of telephone services according to claim 2, characterized in that the call transfer is an automatic transfer, of the calls addressed to a telephone terminal of an installation, to another terminal of this installation or to a terminal external to this installation.

4. System for the implementation of telephone services according to claim 1 characterized in that the telephone service requested is the automatic calling back of a terminal of the calling party in order to connect it with a called terminal.

5. System for the implementation of telephone services according to claim 4, characterized in that calling terminal is a terminal of a telephone installation or external terminal and in that the called terminal is a telephone terminal internal or external to this installation.

6. System for the implementation of telephone services, according to claim 1, characterized in that the telephone service is the management of the incoming calls, for subscribers to the PABXs or for a particular service.

7. System for the implementation of telephone services according to any of the above claims, characterized in that the interface comprises one or more analog or digital modems and a coupler used to connect this modem or these modems to the computer link.

8. System for the implementation of telephone services according to any of the above claims, characterized in that the driving of the automatic branch exchange by the server is secured by an authentication procedure or by the enciphering of the messages sent, between the CTI server (40) and the interface (300).

9. System for the implementation of telephone services according to any of the above claims, characterized in that the telephone lines connecting an interface to one or more automatic branch exchanges are analog or digital lines.

10. System for the implementation of telephone services according to any of the above claims, characterized in that the interface takes the form of packs.

11. System for the implementation of telephone services according to any of the above claims, characterized in that the signalling control signals are DTMF or ISDN or voice signals.

12. Telecommunications server (CTI), according to claim 1, characterized in that it is connected to one or more private automatic branch exchanges (PABX) by means of a computer link through at least one interface connected by telephone lines to said automatic branch exchange or exchanges in order to drive this automatic branch exchange or these automatic branch exchanges to obtain telephone services, said automatic branch exchanges possibly being of different technologies.

13. Telecommunications server (CTI) according to claim 12, characterized in that the interface or interfaces are capable of generating signals corresponding to telephone service commands.

14. Telecommunications server, according to claim 13, characterized in that the telephone service commands are call transfers or automatic calling-back operations or services pertaining to incoming calls.

15. Control device for a private automatic branch exchange (PABX), characterized in that it comprises a telephone interface (301) connected to telephone lines of the automatic branch exchange to convey signals corresponding to telephone service commands and a computer interface comprising a processor (303) to provide a link with a CTI server and convert the commands/signals between CTI server and the switch.

16. Control device for a private automatic branch exchange (PABX) according to claim 15, characterized in that the signalling control signals are DTMF or ISDN or voice signals.

17. Control device for an automatic branch exchange according to any of the claims 15 to 16, characterized in that the telephone lines connecting the interface to the automatic branch exchange are analog or digital lines.

18. Control device for an automatic branch exchange according to any of the claims 15 to 17, characterized in that the telephone interface comprises one or more

analog or digital modems and a coupler used to connect this modem or these modems to the computer link.

19. Control device for an automatic branch exchange according to any of the claims 15 to 18, characterized in that the interface takes the form of packs.

20. Control device for an automatic branch exchange according to any of the claims 15 to 19, characterized in that the signalling control signals are DTMF or ISDN or voice signals..

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Bureau international

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(54) **Title:** SYSTEM FOR IMPLEMENTING TELEPHONE SERVICES, CONTROL UNIT FOR AN AUTOMATIC SWITCH AND TELEPHONE AND COMPUTER INTEGRATION SERVER

(54) **Titre:** SYSTEME DE MISE EN OEUVRE DE SERVICES TELEPHONIQUES, ORGANE DE COMMANDE D'UN AUTOCOMMUTATEUR ET SERVEUR CTI

(57) **Abstract**

The invention concerns a system for implementing telephone services on one or several telephone installations themselves comprising several telephone terminals (10) managed by one or several private automatic switches (20). The system comprises therefor a computer equipment of the server–type (40) accessible through a computer network and several interfaces (300) for transmitting DTMF, ISDN or speech control signals corresponding to the service(s) requested for controlling one or several automatic switches (20), said interfaces being therefor connected to telephone lines of the automatic switches (L1, l2).

(57) **Abrégé**

L'invention concerne un sytème de mise en oeuvre de services téléphoniques sur une ou plusieurs installations téléphoniques comprenant elles–mêmes plusieurs terminaux téléphoniques (10) gérés par un ou plusieurs autocommutateurs privés (20). A cette fin, le système comporte un équipement informatique de type serveur (40) accessible par un réseau informatique et une ou plusieurs interfaces (300) aptes à émettre des signaux de commande de signalisation DTMF, RNIS ou vocale correspondant au(x) service(s) demandé(s) pour piloter un ou plusieurs autocommutateurs (20), ces interfaces étant pour cela reliées à des lignes téléphoniques des autocommutateurs (L1, L2).

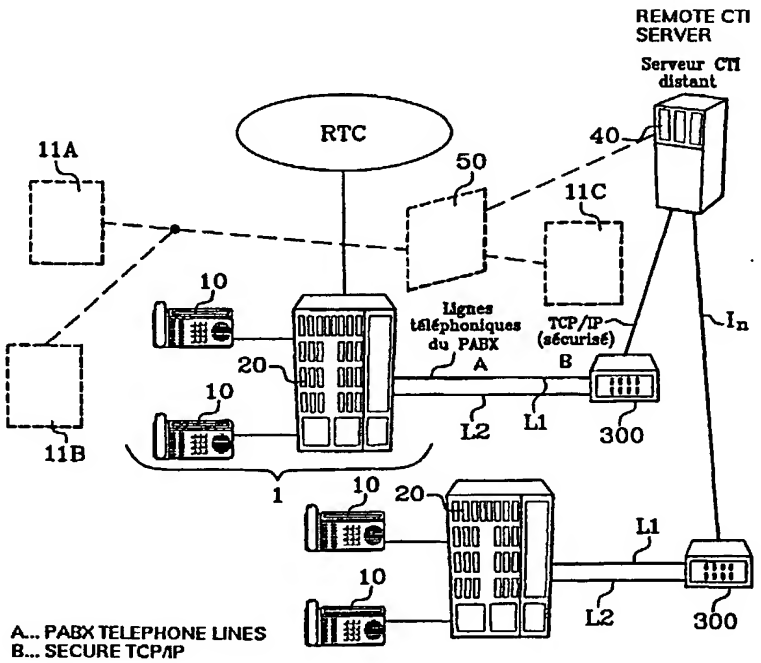


Fig. 1

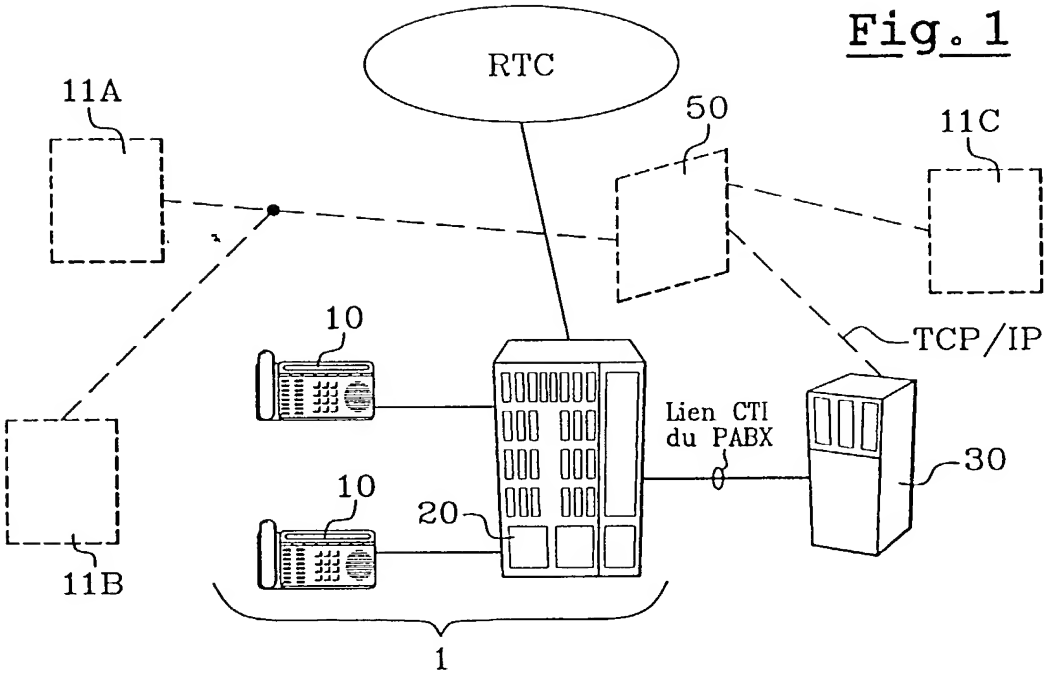
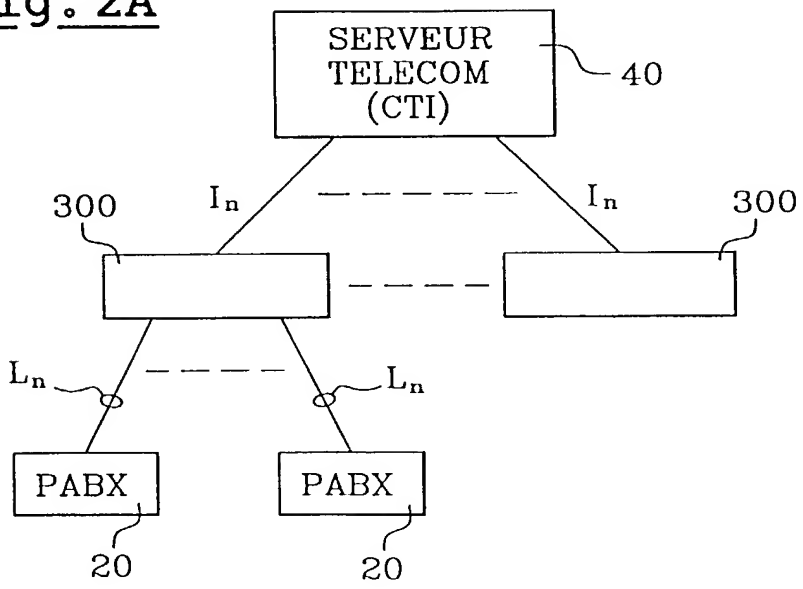

RTC
11A
50
11C
10
TCP/IP
Lien CTI
du PABX
30
10
20
11B
1

Fig. 2A


SERVEUR
TELECOM
(CTI)
40
300
In
In
300
Ln
Ln
PABX
PABX
20
20

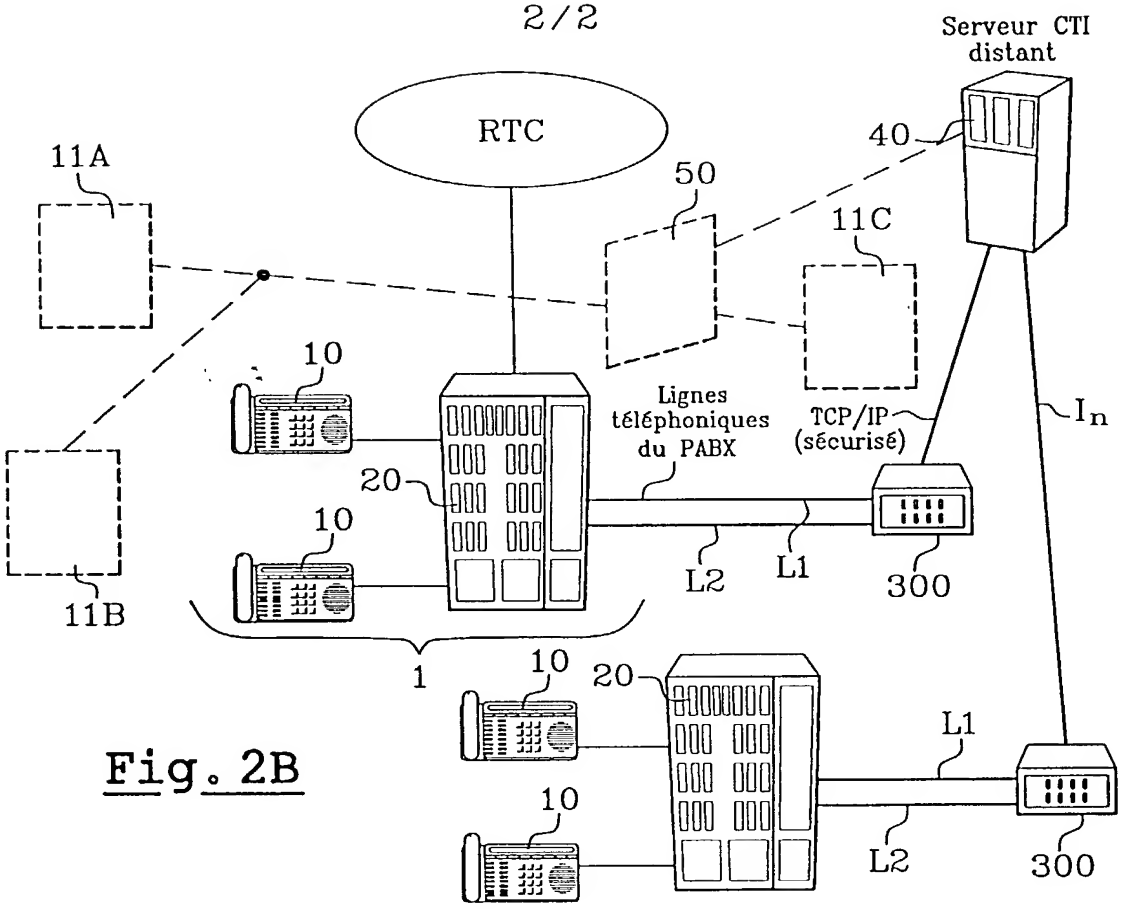

Serveur CTI distant
RTC
40
50
11A
11C
10
Lignes téléphoniques du PABX
TCP/IP (sécurisé)
In
20
10
L2
L1
300
11B
1
10
20
L1
10
L2
300

Fig. 2B

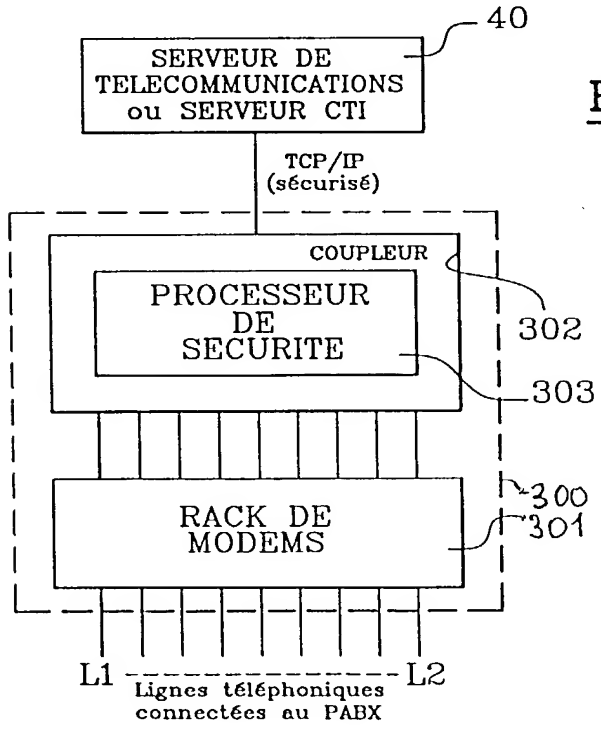

40
SERVEUR DE TELECOMMUNICATIONS ou SERVEUR CTI
TCP/IP (sécurisé)
COUPLEUR
PROCESSEUR DE SECURITE
302
303
RACK DE MODEMS
300
301
L1
L2
Lignes téléphoniques connectées au PABX

Fig. 3

COMBINED DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63) and POWER OF ATTORNEY

☐ Declaration Submitted with Initial Filing
OR
☒ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16(e)) required)

Attorney Docket Number: 136.164
First Named Inventor: Christian Collette
COMPLETE IF KNOWN
Application Number: 10/031,245
Filing Date: October 19, 2001
Group Art Unit:
Examiner Name:

As a below named inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

System for Implementing Telephone Services, Automatic Branch Exchange Control Device and CTI Server

the specification of which
☐ is attached hereto and is a national phase of PCT/FR00/01012
OR
☒ was filed on October 19, 2001 as United States Application Number or PCT International Application Number 10/031,245 and was amended on October 19, 2001 (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to the patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)			Priority Not Claimed	Certified Copy Attached?
99 04905 (Number)	France (Country)	April 19, 1999 (Foreign Filing Date)	☐	☐ Yes ☐ No
PCT/FR00/01012 (Number)	France (Country)	April 18, 2000 (Foreign Filing Date)	☐	☐ Yes ☐ No
(Number)	(Country)	(Foreign Filing Date)	☐	☐ Yes ☐ No

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

(Application Number) (Filing Date)

(Application Number) (Filing Date)

☐ Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

10031245 .042902 03157

136.164

COMBINED DECLARATION – Utility or Design Patent Application and POWER OF ATTORNEY

As a below-named inventor, I hereby appoint the registered practitioners named below as my/our attorney(s) or agent(s) to prosecute this application, and to transact all business in the Patent and Trademark Office connected therewith:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of Sole or First Inventor: ☐ A petition has been filed for this unsigned inventor

100

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Inventor's Signature: _____ Date: 11 Janvier 2002

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Inventor's Signature: _____ Date: _____

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Full name of Third Inventor, if any: ☐ A petition has been filed for this unsigned inventor

Given Name (first & middle [if any]) and Family Name or Surname: _____

Inventor's Signature: _____ Date: _____

Residence (city, state, country): _____ Citizenship: _____

Mailing Address: _____

(city, state, zip, country): _____

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